

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Animal Abstract

Element Code: AMACD02011

Data Sensitivity: YES

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Eumops perotis californicus*

COMMON NAME: Greater Western Mastiff Bat; Greater Mastiff Bat; Western Mastiff Bat;
Bonnet Bat

SYNONYMS: *Molossus californicus*

FAMILY: Molossidae

AUTHOR, PLACE OF PUBLICATION: *Eumops perotis californicus*, Sanborn 1932. J.
Mamm. 13:351. *Molossus californicus*, Merriam. 1890. North America Fauna. 4:31.

TYPE LOCALITY: Alhambra, Los Angeles County, California.

TYPE SPECIMEN:

TAXONOMIC UNIQUENESS: One of 6 North American species of *Eumops*; one of 2 species of *Eumops* found in Arizona; the only subspecies of *E. perotis* occurring in North America is *E. p. californicus* (Hall 1981).

DESCRIPTION: Largest bat in the United States, forearm 73.0-83.0 mm (2.9-3.3 in.), weight 53-61 g, total length 140.0-185.0 mm (5.6-7.4 in.). Wings long and narrow, wingspan 530.0-570.0 mm (21.2-22.8 in.). Ears protrude forward, large, 40 mm (1.6 in.), joined at base; tragus broad and square, 36.0-47.0 mm (1.44-1.88 in.). Distal half of tail free from interfemoral membrane. Pelage dark gray or brownish gray being slightly lighter underneath; hairs bicolor, nearly white at base. Has a strong odor partially due to a gland on throat, which exudes oil.

AIDS TO IDENTIFICATION: Members of the family Molossidae are distinguished from all other families in Arizona by the presence of a tail extending more than 15.0 mm (0.6 in.) beyond tail membrane. The genus *Eumops* is distinguished from the other two genera (*Tadarida* and *Nyctinomops*) of the family found in Arizona by a smooth upper lip which lacks vertical creases or wrinkles and lack of anterior emargination of the palate, both of which characteristics are found in both of the other genera. Distinguished from *E. underwoodi* by larger size of *E. perotis californicus*, forearm longer than 73.0 mm (2.92 in.); ear measured from notch longer (approx. 40.0 mm (1.6 in.) in *E. p. californicus* and approx. 30.0 mm (1.2 in.) in *E. underwoodi*). *E. perotis californicus* is darker in color than *E. underwoodi* and lacks the long guard hairs on the rump which *E. underwoodi* possesses. *E. p. californicus* makes a distinctive, piercing, high-pitched 'cheep' every 2 to 3 seconds during flight. The call is louder than that of any other U.S. bat and, unlike other bats, it is emitted almost continuously while

flying. The calls are not as intense as those of *E. underwoodi*. Once learned, detection of *E. perotis californicus* call can be used to determine its presence in an area (Cockrum 1960:83). Another possible means of identification is the sharp, swishing sound made by the wings during flight. It is reported that these sounds can be heard up to about 100 feet away. At roost sites, the massive, yellow urine stains and the large droppings are distinctive.

ILLUSTRATIONS: Black and white photo (Barbour and Davis 1969: 218, 221)
Color photo (Barbour and Davis 1969: plate XXII)
Color photo (Whitaker 1980: plate 150)
Color photo (Oakland Museum of CA in http://www.museumca.org/caves/onli_echo_mastiff.html)
Color photo (Tuttle in <http://home.earthlink.net/~cmsquare/westmast.html>)
B & W photo (UCLA in http://www.eip.cdlib.org/eip/digital/ucla_biomed/C247.html)
Color photo (Wilson 1999)
Color photo (Harvey et al. 1999)
B & W drawing (Sears in <http://arnica.csustan.edu/esrpp/eperotis.htm>)
Color photo (Tuttle in AGFD 1993)

TOTAL RANGE: From California (San Francisco across to the Sierra Nevada and south) through Las Vegas, Nevada southern half of Arizona to Big Bend, Texas area and south to Sinaloa in northwestern Mexico and Zacatecas in central Mexico. This population is one of three widely separated populations; the other two are in South America and Cuba.

RANGE WITHIN ARIZONA: They have been found in all Arizona counties except Yavapai, Navajo, Apache and Santa Cruz. Considered a year-round resident in Arizona based on collections or calls heard in every month except January. One specimen collected after death near Flagstaff in December 1992 (Noel, 1993). Echo location recorded and verified by sonogram by Dr. D. Pearson at Point Sublime on the North Rim of the Grand Canyon (Toone, pers. comm. 1992).

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Whether or not this bat hibernates during winter is unclear. Limited evidence suggests that during winter months it goes into torpor every day, but arouses and leaves the roost to forage at night when temperatures at dusk are above 5° C. This bat can tolerate ambient temperatures of 38° - 39°C (100° - 102°F) without undue heat stress (Barbour and Davis 1969).

The hind legs of this bat are not as reduced as in other bats allowing it to crawl rapidly. When crawling the tail is extended at about a 45° angle and may serve as a tactile organ when in a crevice. These bats are active within their roosts throughout the day. For the species it has been found that they emit many loud cheeping sounds while flying that are audible to the

human ear. And they are capable of fast and prolonged flight but cannot get airborne from the ground. They will scramble up a post or a tree in order to achieve a minimum height of some 5m necessary for launching into flight.

REPRODUCTION: Most likely breeds in early spring when male's testes are enlarged. The odiferous gland at the base of the throat is most active in males in March and is thought to be related to reproduction. Although the gland is present in all individuals it is most conspicuous in males. Parturition time varies more in this bat than in any others in the U.S. Young have been found as early as June and as late as August. For the species, gestation is 80-90 days. Litter size is one young per year. For *Eumops perotis* the offspring are dull black in color at birth and are naked, except for the tactile hairs on the feet and the face. The timing and degree of separation of the sexes is unclear. While both sexes have been found together throughout the year, males are found less commonly in maternity colonies.

FOOD HABITS: *E. p. californicus* usually leave daytime roosts about one hour after sunset (when completely dark) to forage. They feed on insects (moths, crickets, grasshoppers, dragonflies, leaf bugs, true bugs, beetles), especially Hymenoptera (bees, wasps, ants and sawflies). They forage at considerable heights (100 to 200 feet; sometimes to 1000 feet or more) over extensive areas for long (about 6½ hours) periods during the night. They don't seem to have activity peaks during the night, as do many other bats. They are known to forage at least 15 miles from the nearest likely roosting sites. They may forage on rainy nights and have even been heard during a thunderstorm. This bat also prefers to feed over large open bodies of water (e.g. ponds, reservoirs etc), making them difficult to net. For the species it has been found that sometimes they forage by crawling on the ground, with the tail held up in the air (<http://home...westmast.html>).

HABITAT: Lower and upper Sonoran desertscrub near cliffs, preferring the rugged rocky canyons with abundant crevices. They prefer crowding into tight crevices a foot or more deep and two inches or more wide. Colonies prefer crevices even deeper, to ten or more feet. These bats prefer to wedge themselves in the backs of cracks or crevices where they narrow down considerably. Entrances to roosting crevices are usually horizontal but facing downward which facilitates entry and exit.

The large body and narrow wings make ground launching difficult. According to Barbour and Davis, they regularly use roosts allowing them a vertical drop of 10 or more feet. These bats roost singly, in groups of two or more, but usually in colonies of up to 100 individuals. Many roost sites do not seem to be occupied year-round, although they are likely to be occupied periodically. They often move around among several roost sites even when they have young. This is thought to be influenced by temperature as well as human disturbance.

ELEVATION: Based on records in the Heritage Data Management System, elevation ranges from 240 – 8,475 ft. (73 - 2583 m) (AGFD, unpublished data accessed 2002).

PLANT COMMUNITY: Sonoran desertscrub.

POPULATION TRENDS: Poorly known. Some roost sites are no longer occupied.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[C2 USDI, FWS 1994]
[C2 USDI, FWS 1991]
[C2 USDI, FWS 1989]
[C2 USDI, FWS 1985]

STATE STATUS: None

OTHER STATUS: None (USDA, FS Region 3 1999)
[Forest Service Sensitive USDA, FS Region 3 1988]

MANAGEMENT FACTORS: Vulnerability of maternity colonies. According to Acker (*in* Chebes 2000) the species uses only select drinking sites and is severely limited by the availability of drinking water. Because its' wing structure is adapted for fast and straight-line flight, it is unable to drink from water sources less than 30m long. As a consequence, Western mastiff bats are no longer found in many previously occupied areas and populations may be in decline. According to the Texas Parks and Wildlife Department they are also threatened by urban/suburban expansion and by activities that disturb or destroy cliff habitat (e.g. water impoundments, highway construction, quarry operations). Recreational climbing is another potential threat. Pest control operations have eliminated most known building colonies in the Los Angeles basin. Grazing and pesticide applications in agricultural areas may impact foraging habitat.

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS: Status survey. More information is needed on distribution of breeding colonies, seasonal movements, and roosting and foraging requirements.

LAND MANAGEMENT/OWNERSHIP: BIA - Hualapai Reservation; BLM - Arizona Strip, Kingman, Tucson and Yuma Tucson Field Offices; DOD - Barry M. Goldwater Air Force Range, and National Guard Military Reservation; FWS - Havasu National Wildlife Refuge; NPS - Casa Grande, Organ Pipe Cactus and Tonto National Monuments, Grand Canyon National Park, and Lake Mead National Recreation Area; USFS - Coronado and Kaibab National Forests; State Land Department; Hualapai Mountain County Park; John F. Kennedy Park; Private.

SOURCES OF FURTHER INFORMATION

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

E.L. Cockrum - University of Arizona, Tucson.

D.F. Hoffmeister - University of Illinois, Urbana.

P. Brown - Maturango Museum, Ridgecrest, California.

ADDITIONAL INFORMATION:

These bats are seldom netted over water or in flyways and their roosts are difficult to find or get to. However, since their echolocation calls are distinctive and field workers can be trained to identify them surveys may be most efficiently conducted by listening for their calls at selected localities.

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